Integration of Space Geodesy: A US National Geodetic Observatory

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Abstract

In the interest of improving both the performance and efficiency of space geodesy a diverse group in the US, in collaboration with IGGOS, has begun to establish a unified National Geodetic Observatory (NGO). To help launch this effort an international team will conduct a 3-year program of joint research into the technical issues of integrating SLR, VLBI, and GPS geodesy to produce a unified set of global geodetic products. The goal is to improve measurement accuracy by up to an order of magnitude while lowering the cost to current sponsors. Principal benefits will be to open new vistas of research within both the Geodynamics and Surface Change themes while freeing funds for scientific studies.

The NGO campaign will be conducted in full partnership with, and under the auspices of, the International Association of Geodesy (IAG) as a central element of the IGGOS (Integrated Global Geodetic Observation System) project. The international collaboration will be conducted within, and will make full use of, the IAG's existing international services (IGS, IVS, ILRS, and IERS). A principal secondary goal is to expand and diversify international sponsorship of space geodesy.

Under NGO the space geodetic techniques in the US will operate within an independent, self-governing federation to create a unified system architecture and establish joint goals, priorities, and proposals, guided by a shared strategic vision. The aim is to bring stability and continuity to providers and users alike while pushing the limits of geodetic accuracy, improving efficiency, nurturing emerging techniques, responding quickly to changing needs, and reducing the financial burden to current sponsors. Specific objectives are to:

- Review the current state of space geodesy:
- Develop the analytical underpinnings of integrated space geodesy:
- Unify the planning and operations for space geodesy within NASA and internationally:
- Broaden sponsorship by enlisting the many institutions and agencies that use and benefit from space geodetic products

Initial seed funding for NGO, to support organizational activities and assist the technical analysis, will come from the Solid Earth and Natural Hazards Program within NASA's Earth Science Enterprise. The NASA contribution will be amplified many-fold by the efforts and contributions of our US and international partners through the broader IGGOS. Other essential proposals are under review, including one for an integrated geodetic data system known as INDIGO (Interservice Data Integration for Geodetic Operations), also submitted to NASA. INDIGO will offer improved efficiency in geodetic science by providing uniform access to heterogeneous space geodetic data systems and will extend the GPS Seamless Archive (GSAC) philosophy to all geodetic data types. This presentation will review the status and prospects for NGO and INDIGO, and describe their roles as elements of the greater IGGOS campaign.